

WHAT IS CLAIMED:

1. Interference suppression filter and lightning current diverter device (1) in a coaxial line for the transmission of high-frequency signals, comprising a housing (2) with two connectors (7, 8), the housing (2) forming an outer conductor (4) connected to ground, and an inner conductor (3) guided through the housing (2) as well as a connection (5, 6) between inner conductor (3) and housing (2), characterized in that the connection comprises at least one pair of two lines (5, 6; 60, 61), these two lines (5, 6; 60, 61) are disposed at least partially approximately parallel and overlapping with respect to one another, the two lines (5, 6; 60, 61) are insulated against one another, both lines (5, 6; 60, 61) comprise at one of their two ends (10, 11) a contact element (27, 28; 67, 68) with respect to the inner conductor (3) and at the other end (14, 15) each a contact element (18, 19; 69, 70) with respect to the housing (2) and these contact elements (18, 19, 27, 28 and 67, 68, 69, 70, respectively) of the two lines (5, 6; 60, 61) are disposed such that the directions of flow of the currents in the parallel regions of the two lines (5, 6; 60, 61) are directed counter one another.

2. Interference suppression filter and lightning current diverter device as claimed in patent claim 1, characterized in that the lines (5, 6) are disposed approximately parallel to the inner conductor (3) and on a cylindrical surface concentric with the inner conductor (3), the two contact elements (27, 28) of the two lines (5, 6) connected with the inner conductor (3) are disposed spaced apart from one another in the direction of the longitudinal axis (9) of the inner conductor (3), and the two lines (5, 6), starting from these contact elements (27, 28), are directed counter to one another.

3. Interference suppression filter and lightning current diverter device as claimed in patent claim 1 or 2, characterized in that the housing (2) includes a cylindrical core hollow space (32) and the inner conductor (3) and the lines (5, 6) are disposed at a spacing from one another in this core hollow space (32).

4. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 or 2, characterized in that the housing (2') includes a cylindrical core hollow space (33), in this core hollow space (33) is guided the inner conductor (3), in the housing (2') an additional hollow space (34) extending approximately parallel to the core hollow space (33) is disposed and each of the lines (5', 6') is guided individually in this additional hollow space (34).

5 5. Interference suppression filter and lightning current diverter device as claimed in patent claim 1, characterized in that the two lines (60, 61) are each disposed in a radial plane and extend concentrically with the inner conductor (3), these two radial planes are  
10 disposed approximately at right angles to the inner conductor (3) and at a spacing (66) with respect to one another and the contact elements (67, 68) with respect to the inner conductor (3) at one end of each of the two lines (60, 61) are directed radially inwardly and the contact elements (69, 70) with respect to the housing (2) at the other ends of the two lines (60, 61) approximately radially outwardly.

15 6. Interference suppression filter and lightning current diverter device as claimed in patent claim 1, characterized in that the two lines (60', 61') in the form of loops and approximately parallel to one another in a common surface, this surface extending at a spacing to the inner conductor (3) and disposed concentrically or parallel tangentially to the inner conductor, the contact elements (67, 68) at one end of the two lines (60', 61') are  
20 directed approximately radially toward the inner conductor (3) and are connected with it, and the contact elements (69, 70) at the other ends of the two lines (60', 61') are connected with the housing (2).

25 7. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 6, characterized in that the two lines (5, 6; 60, 61) between inner conductor (3) and housing (2) are  $\lambda/4$  shortcircuit lines.

8. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 7, characterized in that the two lines (5, 6; 60, 61) are electrically elongated  $\lambda/4$  shortcircuit lines.

5 9. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 8, characterized in that each line (5, 6; 60, 61) comprises a capacitance (49) and an inductance (48) forming a parallel resonance circuit.

10 10. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 9, characterized in that in the proximity of the two contact elements (27, 28; 67, 68) between the inner conductor (3) and the two lines (5, 6; 60, 61) on the inner conductor (3) one capacitance each (43, 47) is implemented and the inner conductor (3) comprises between the two connections (7, 8) a further capacitance (45) and at least one inductance (44, 46).

15 11. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 10, characterized in that at the output side (21) of the device on the inner conductor (3) a capacitor (50) is disposed.

20 12. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 10, characterized in that between the ends (14, 15) of the two lines (5, 6; 60, 61), with the contact elements (16, 17; 69, 70) with respect to the housing (2), and the housing (2) one capacitor (52, 54) each and in parallel with it one additional pulse-diverting element (51, 53) each is interconnected.

13. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 12, characterized in that the lines (5, 6; 60, 61) and the contact elements (16, 17 / 27, 28; 67, 68 / 69, 70) form different line sections and determine the bandwidth and the frequency range of the HF transmission.

14. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 13, characterized in that the inner conductor (3) comprises different line sections (56, 57) and these and the dielectric (24, 38) about this inner conductor (3) determine the characteristic over the bandwidth of the HF transmission.

5        15. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 13, characterized in that two lines (5, 6; 60, 61) each are combined to form a pair, and several pairs of lines (5, 6; 60, 61) are installed between inner conductor (3) and housing (2).

10      16. Interference suppression filter and lightning current diverter device as claimed in patent claim 12, characterized in that the pulse-diverting element (51, 53) is a gas discharge diverter or a varistor or a diode and across this pulse-diverting element (51, 53) and the capacitor (52, 54) a DC feed (55) is disposed.

15      17. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 6, characterized in that the inner conductor (3) separates the two lines (5, 6; 60, 61) as well as the housing (2, 2') from one another through dielectrics (24; 25; 62; 63).

20      18. Interference suppression filter and lightning current diverter device as claimed in one of patent claims 1 to 6, characterized in that, with the exception of the contact elements (18, 19; 27, 28; 69, 70; 67, 68), at the ends of the two lines (5, 6; 60, 61) all effective structural elements are disposed concentrically to the longitudinal axis (9) of the inner conductor (3) or of the device (1) or parallel to this longitudinal axis (9).